Remedial Investigation/Feasibility Study Work Plan

Pines Area of Investigation
AOC II
Docket No. V-W-'04-C-784

Volume 1

Work Plan Overview

ENSR Corporation

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ACRONYMS

AOC I	Administrative Order on Consent, 2003 and as amended, 2004; Docket No. V-W-03-730
AOC II	Administrative Order on Consent, 2004; Docket No. V-W-'04-C-784
ARAR	Applicable or Relevant and Appropriate Requirement
CCB	Coal Combustion By-product
COPC	Constituent of Potential Concern
CSM	Conceptual Site Model
ENSR	ENSR Corporation
ERA	Ecological Risk Assessment
FS	Feasibility Study
FSP	Field Sampling Plan
GIS	Geographic Information System
HASP	Health and Safety Plan
HHRA	Human Health Risk Assessment
IDEM	Indiana Department of Environmental Management
IDNL	Indiana Dunes National Lakeshore
MWSE	Municipal Water Service Extension
NCP	National Contingency Plan
NIPSCO	Northern Indiana Public Service Company
OSHA	Occupational Safety and Health Administration
QA	Quality Assurance
QAPP	Quality Assurance Project Plan
QMP	Quality Management Plan
RAL	Removal Action Level
RAO	Remedial Action Objective
RI/FS	Remedial Investigation and Feasibility Study
SAP	Sampling and Analysis Plan
SERA	Screening Level Ecological Risk Assessment
SMS	Site Management Strategy
SOW	Statement of Work
TAL	Target Analyte List
TBC	Guidance to be Considered
USEPA	United States Environmental Protection Agency
USGS	U.S. Geological Survey

DISCLAIMER

This document is a document prepared under a federal administrative order on consent and revised based on comments received from the U.S. Environmental Protection Agency (USEPA). This document has been approved by USEPA, and is the final version of the document.

1.0 INTRODUCTION

In April 2004, the United States Environmental Protection Agency (USEPA) and the Respondents (Brown Inc., Ddalt Corp., Bulk Transport Corp. and Northern Indiana Public Service Company (NIPSCO)) signed an Administrative Order on Consent (AOC II) (Docket No. V-W-'04-C-784) to conduct a Remedial Investigation and Feasibility Study (RI/FS) at the Pines Area of Investigation, as set forth in Exhibit I to AOC II, located in the environs of the Town of Pines, Indiana. AOC II (Section VII. 20) and the Statement of Work (SOW) (Task 2), which is provided as an attachment to AOC II, require the Respondents to develop an RI/FS Work Plan. This document has been prepared to follow the requirements in AOC II and the SOW, as well as to be compliant with the National Contingency Plan (NCP) (USEPA, 1990). For reference, Appendix A to this document includes a copy of AOC II and the SOW.

The term the "Pines Site" has been used for the areas designated in AOC I (Docket No. V-W-03-730) to receive municipal water supply, the area designated in AOC I (amended) to receive municipal water supply, and the area to be investigated in the RI/FS under AOC II. To avoid confusion, in documents submitted under AOC II, the area to be investigated under the RI/FS will be referred to as the Pines Area of Investigation, or Area of Investigation.

1.1 Background

Between 2000 and 2004, the Indiana Department of Environmental Management (IDEM) and USEPA responded to homeowners by conducting sampling of private water supply wells in a portion of the Town of Pines. In some of these samples, boron and molybdenum were detected at concentrations above USEPA's Removal Action Levels (RALs) (USEPA, 1998). These concentrations in groundwater are suspected by the USEPA to be derived from coal combustion by-products (CCBs). CCBs have been disposed at a permitted Restricted Waste Facility known as Yard 520, and CCBs are suspected to have been used as fill in areas within the Area of Investigation outside of Yard 520. Yard 520 is operated by Brown Inc., and most of the CCBs at Yard 520 were generated during combustion of coal at NIPSCO's Michigan City Generating Station.

To address the boron and molybdenum detections above the USEPA RALs, the Respondents agreed to extend the municipal water service from Michigan City to selected portions of the Town of Pines. This agreement was documented in an Administrative Order on Consent, referred to as AOC I. Additional sampling of other private wells indicated some concentrations near or exceeding USEPA RALs. To address this, the Respondents voluntarily approached the USEPA to discuss extending the municipal water service to a larger area under an amendment to AOC I. Figure 1 shows the Pines Area of Investigation, including areas previously connected to municipal water (North Area and South Area) and areas to be connected to municipal water under AOC I (amended). Figure 2 is a U.S. Geological Survey (USGS) topographic map showing the Area of Investigation, and more detail is shown on Figure 3, which is a detailed 2-foot contour topographic basemap that was prepared for this

project. The Area of Investigation was flown on March 13, 2004, and the basemap was prepared by Air Maps Inc. of Elkhart, Indiana.

The Respondents also signed AOC II to conduct an RI/FS for the Area of Investigation, as identified in the Order. Under the SOW, Task 1 was the preparation of a Site Management Strategy (SMS). A draft SMS document, which outlined a preliminary conceptual model, data gaps, and the strategy for certain elements of the RI/FS was submitted in June 2004. A revised SMS, based on comments received from the USEPA, was submitted in September 2004, and conditionally approved by USEPA in November 2004. Task 1 was completed with submission of the final SMS in January 2005 (ENSR, 2005a).

As outlined in Section VII. 20 of AOC II of the SOW, Task 2 for the Pines Area of Investigation is the preparation of a Work Plan for the RI/FS. The SMS serves as the basis for development of the RI/FS Work Plan. The Work Plan has been prepared as seven volumes, each of which addresses a different aspect of the work to be performed, and which together provide the comprehensive approach and specific details for conducting the RI/FS for the Area of Investigation. The volumes are listed below:

- Volume 1 - Work Plan Overview
- Volume 2 - Field Sampling Plan (FSP)
- Volume 3 - Quality Assurance Project Plan (QAPP)
- Volume 4 - Health and Safety Plan (HASP)
- Volume 5 - Human Health Risk Assessment (HHRA) Work Plan
- Volume 6 - Ecological Risk Assessment (ERA) Work Plan
- Volume 7 - Quality Management Plan (QMP)

The Work Plan (all seven volumes) was submitted as a draft document to the USEPA on January 18, 2005. Comments were received from USEPA on March 24, 2005. The Work Plan was revised and resubmitted on May 23, 2005. This final Work Plan was revised based on verbal comments from USEPA received in June and July, 2005, and a USEPA-provided conditional approval dated August 18, 2005. Responses to the comments received have been prepared, and are provided in Appendix B of this Volume. Each volume has been revised as described in the individual responses.

1.2 Organization of Volume 1, RI/FS Work Plan Overview

This volume, Volume 1, of the RI/FS Work Plan for the Pines Area of Investigation, provides:

- Detailed information on the overall organization of the seven volumes comprising the RI/FS Work Plan (Section 2.0);

- A summary of the SMS, including data gaps to be addressed by the RI/FS Work Plan (Section 3.0);
- An overview of the general approach to the RI/FS (Section 4.0);
- A schedule for the overall RI/FS (Section 5.0);
- The project organization and management structure (Section 6.0); and
- References cited in this document (Section 7.0).

2.0 ORGANIZATION OF RI/FS WORK PLAN

The RI/FS Work Plan for the Pines Area of Investigation has been organized into seven separate volumes. Together, these volumes comprise the comprehensive RI/FS Work Plan. The individual volumes and their general contents are described in the following sections.

2.1 Volume 1 - RI/FS Work Plan Overview

Volume 1 of the RI/FS Work Plan (i.e., this document), provides a general overview of the Work Plan and its contents. It also provides detailed information on the organization of the RI/FS Work Plan; a summary of the SMS, including identifying data gaps to be addressed by the RI/FS Work Plan; an overview of the approach to the RI/FS; a schedule for the RI/FS project deliverables; and the project organization and management structure.

2.2 Volume 2 - Field Sampling Plan (FSP)

Volume 2 of the RI/FS Work Plan is the FSP for the Area of Investigation. The FSP provides guidance for the RI field investigation by defining in detail the sampling and data-gathering activities and methods to be used to meet the objectives of the investigation. The FSP presents a detailed description of the field activities planned as a part of the RI. The goal of the FSP is to collect sufficient sampling data to support the evaluation of potential human health and ecological risks, and select an appropriate remedy, if necessary. As noted in the SOW, based on evaluations of the data collected initially under the FSP, an additional phase of data collection may occur.

2.3 Volume 3 - Quality Assurance Project Plan (QAPP)

Volume 3 of the RI/FS Work Plan is the project-specific QAPP for all sample analyses and data handling activities to be conducted during the RI. The QAPP has been prepared: (1) to follow the USEPA Region 5 Superfund Division Model QAPP guidance; and (2) in accordance with "EPA Requirements of Quality Assurance Project Plans (QA/R-5)" (EPA/240/B-01/003, March 2001) and "EPA Guidance for Quality Assurance Project Plans (QA/G-5)" (EPA/240/R-02/009, December 2002).

2.4 Volume 4 - Health and Safety Plan (HASP)

Volume 4 of the RI/FS Work Plan is the project-specific HASP for the RI. The HASP conforms to the corporate Health and Safety program of ENSR Corporation (ENSR) and complies with the Occupational Safety and Health Administration (OSHA) regulations and protocols outlined in Title 29 of the Code of Federal Regulations, Part 1910 and USEPA's "Standard Operating Safety Guides" (USEPA, 1992). The HASP includes the 11 elements described in USEPA's RI/FS Guidance Manual

(USEPA, 1988), including a health and safety risk analysis, a description of monitoring and personal protective equipment, and medical monitoring.

2.5 Volume 5 - Human Health Risk Assessment (HHRA) Work Plan

Volume 5 of the RI/FS Work Plan is the HHRA Work Plan. The HHRA Work Plan establishes the methods for evaluating human health risks using data collected as part of the RI.

2.6 Volume 6 - Ecological Risk Assessment (ERA) Work Plan

Volume 6 of the RI/FS Work Plan is the ERA Work Plan. The ERA Work Plan establishes the methods for evaluating environmental risks using data collected as part of the RI.

2.7 Volume 7 - Quality Management Plan (QMP)

Volume 7 of the RI/FS Work Plan is the QMP. The QMP demonstrates that the proposed contractor for the work under AOC II has a quality management system in place that complies with American National Standards Institute and American Society for Quality Control guidelines. As such, Volume 7 of the RI/FS Work Plan provides the QMP for ENSR, who is the contractor selected by the Respondents and approved by USEPA for performing the environmental investigation work under AOC II.

3.0 SITE MANAGEMENT STRATEGY OVERVIEW

Section VII.19 of AOC II and Task 1 of the SOW set forth the requirements for a SMS for the Pines Area of Investigation. In accordance with these requirements, the SMS has been prepared, submitted to, and approved by the USEPA (ENSR, 2005a). This section provides an overview of the SMS as it pertains to development of the RI/FS Work Plan.

3.1 Description of SMS

The SMS document establishes the general foundations for the RI and FS. The SMS includes a listing of the historical information and background records reviewed during preparation of the SMS, a preliminary conceptual model, a summary of identified data gaps, and an outline of the approach to be used to implement the RI and FS. The information presented in the SMS serves as the basis for the RI/FS Work Plan, which provides specific work to be performed to fill the data gaps and meet the objectives of the RI/FS. USEPA conditionally approved of the SMS on November 4, 2004. The final SMS was submitted in January 2005 (ENSR, 2005a).

3.2 Conceptual Site Model

An important complement of the SMS is the preliminary Conceptual Site Model (CSM), which summarized the available information. The preliminary CSM discussed/presented:

- Regional and local geology and hydrogeology;
- Regional and local information on the hydrology of Brown Ditch;
- A description of groundwater-surface water interactions;
- A description of potential sources in the Area of Investigation, including CCBs;
- A description of the chemical and physical characteristics of CCBs;
- A summary of the analytical information collected from private wells in the Area of Investigation;
- Available background water quality information;
- A discussion of the nature and occurrence of boron and molybdenum;
- Fate and transport of CCB-derived constituents; and
- Potential receptors of CCB-derived constituents in groundwater.

3.3 Data Gaps for RI/FS

The SMS provides the current conceptual understanding of the Area of Investigation. It identifies certain data gaps to be filled to more fully understand the nature and extent of CCB-derived constituents in the environment and potential risks. These data gaps are the basis for the work proposed in this RI/FS Work Plan, and are summarized as follows.

The preliminary CSM presented in Section 3 of the SMS was based on information available as of September 2004. At that time, a large quantity of information was available for areas in the immediate vicinity of Yard 520, and for the region; however, most of the Area of Investigation is outside of Yard 520, and little detailed information is available. The following is a list of general data gaps which the RI/FS Work Plan has been prepared to address.

CCB data. The possible locations of CCBs outside Yard 520 but within the Area of Investigation and their chemical and physical characteristics will have to be verified to the extent necessary to appropriately characterize potential risks and potential migration of constituents to groundwater.

Geological data. Data are needed for the characterization of the Area of Investigation, including depth to the confining unit, characterization of the surficial aquifer, extent of swamp/peat deposits, and an understanding of the deeper aquifers and the extent to which they influence the surficial aquifer.

Hydrogeological data. Data are needed for characterization of the Area of Investigation, including groundwater levels, quantitative aquifer characteristics such as hydraulic conductivity, locations of groundwater divides, seasonal changes to the system, sources and sinks to groundwater, and importance of confined aquifers.

Groundwater-surface water interaction data. Data are needed to understand where and how much groundwater discharges to Brown Ditch, rates of surface water flow in Brown Ditch, and any seasonal changes to these flows. If groundwater containing CCB-derived constituents is found to discharge to other surface water bodies or wetlands, data are needed to characterize the groundwater-surface water relationships at these locations as well.

Ecological habitat data. Data are needed on the benthic and fish communities potentially found in drainage ditches and other relevant water bodies, the wildlife receptors expected there, and the wetland plant communities found there. Evaluation of the potential habitat for terrestrial ecological receptors in CCB fill areas also needs to be conducted.

Groundwater quality data. Data on the nature and extent of CCB-derived constituents in groundwater will be collected to the extent necessary to adequately evaluate potential current and reasonably foreseeable future risks. This will include developing an understanding of general groundwater quality conditions in the Area of Investigation as well as upgradient concentrations.

Geochemical conditions affecting migration will also be evaluated. In addition, data to estimate CCB-derived constituent concentrations in groundwater entering the Indiana Dunes National Lakeshore (IDNL) and potentially present in the shallow saturated zone are needed.

Surface water and sediment quality data. Data are needed to support characterization of the potential human health and ecological risk associated with Brown Ditch including synoptic surface water samples and sediment samples in the west and east branches of Brown Ditch, and in background areas.

Potential source data. The RI will determine to what extent CCBs may be contributing to the presence of boron and molybdenum in groundwater. Data on potential contributions from other sources will be collected and considered.

Air quality data. A potential human health exposure pathway is the inhalation of particulates derived from CCBs either at the surface or disturbed in an excavation. This data gap most likely will be filled using models provided in USEPA guidance, due to the numerous potential background sources of CCB-related constituents in air, and the natural hourly, daily and seasonal fluctuations in air quality.

Fish tissue data. A potential human health exposure pathway is routine consumption of fish from Brown Ditch. An evaluation will be conducted to determine whether or not Brown Ditch does support a recreational fishery.

3.4 Strategy Items for RI/FS

The SMS also presented approaches to certain aspects of the RI/FS. The RI/FS Work Plan follows the SMS approaches with allowance for modifications as additional information becomes available. The approaches and detail on specific strategy items and how they are addressed in the RI/FS Work Plan is provided in Table 1 (which was adapted from Table 2 of the SMS).